

DESCRIPTION OF TABLES AND CHARTS.

Table I gives the data ordinarily needed for climatological studies for about 158 Weather Bureau stations making simultaneous observations at 8 a. m. and 8 p. m., daily, 75th meridian time, and for about 41 others making only one observation. The altitudes of the instruments above ground are also given.

Table II gives a record of precipitation, the intensity of which at some period of the storm's continuance equaled or exceeded the following rates:

Duration (minutes).....	5	10	15	20	25	30	35	40	45	50	60
Rates per hour (inches).....	3.00	1.80	1.40	1.20	1.08	1.00	0.94	0.90	0.87	0.84	0.80

It is impracticable to make this table sufficiently wide to accommodate on one line the record of accumulated falls that continue at an excessive rate for several hours. In this case the record is broken at the end of each 50 minutes, the accumulated amounts being recorded on successive lines until the excessive rate ends.

In cases where no storm of sufficient intensity to entitle it to a place in the full table has occurred the greatest precipitation of any single storm has been given, also the greatest hourly fall during that storm.

The tipping-bucket mechanism is *dismounted* and removed when there is danger of snow or water freezing in the same. Table II records this condition by entering an asterisk (*).

Table III gives, for about 30 stations of the Canadian Meteorological Service, the means of pressure and temperature, total precipitation and depth of snowfall, and the respective departures from normal values except in the case of snowfall.

Chart I.—Hydrographs for several of the principal rivers of the United States.

Chart II.—Tracks of centers of high areas; and

Chart III.—Tracks of centers of low areas. The roman numerals show the chronological order of the centers. The figures within the circles show the days of the month; the letters *a* and *p* indicate, respectively, the observations at 8 a. m. and 8 p. m., 75th meridian time. Within each circle is also given (Chart II) the last three figures of the highest barometric reading or (Chart III) the lowest reading reported at or near the center at that time, and in both cases as reduced to sealevel and standard gravity.

Chart IV.—Temperature departures. This chart presents the departures of the monthly mean temperatures from the monthly normals. The normals used in computing the departures were computed for a period of 33 years (1873 to 1905) and are published in Weather Bureau Bulletin "R," Washington, 1908. Stations whose records were too short to justify the preparation of normals in 1908 have been provided with normals as adequate records became available, and all have been reduced to the 33-year interval 1873–1905. The shaded portions of the chart indicate areas of positive departures and unshaded portions indicate areas of negative departures. Generalized lines connect places having approximately equal departures of like sign. This chart of monthly

temperature departures in the United States was first published in the MONTHLY WEATHER REVIEW for July, 1909.

Chart V.—Total precipitation. The scale of shades showing the depth is given on the chart. Where the monthly amounts are too small to justify shading and over sections of the country where stations are too widely separated or the topography is too diversified to warrant reasonable accuracy in shading, the actual depths are given for a limited number of representative stations. Amounts less than 0.005 inch are indicated by the letter T, and no precipitation by 0.

Chart VI.—Percentage of clear sky between sunrise and sunset. The average cloudiness at each Weather Bureau station is determined by numerous personal observations between sunrise and sunset. The difference between the observed cloudiness and 100 is assumed to represent the percentage of clear sky, and the values thus obtained are the basis of this chart. The chart does not relate to the nighttime.

Chart VII.—Isobars and isotherms at sealevel and prevailing wind directions. The pressures have been reduced to sea level and standard gravity by the method described by Prof. Frank H. Bigelow on pages 13–16 of the REVIEW for January, 1902. The pressures have also been reduced to the mean of the 24 hours by the application of a suitable correction to the mean of the 8 a. m. and 8 p. m. readings at stations taking two observations daily, and to the 8 a. m. or the 8 p. m. observations, respectively, at stations taking but a single observation. The diurnal corrections so applied will be found in the Annual Report of the Chief of the Weather Bureau, 1900–1901, volume 2, Table 27, pages 140–164.

The isotherms on the sea-level plane have been constructed by means of the data summarized in chapter 8 of volume 2 of the annual report just mentioned. The correction, $t_0 - t$, or temperature on the sealevel plane minus the station temperature as given by Table 48 of that report, is added to the observed surface temperature to obtain the adopted sealevel temperature.

The prevailing wind directions are determined from hourly observations at the great majority of the stations. A few stations having no self-recording wind-direction apparatus determine the prevailing direction from the daily or twice-daily observations only.

Chart VIII.—Total snowfall. This is based on the reports from regular and cooperative observers and shows the depth in inches and tenths of the snowfall during the month. In general, the depth is shown by lines inclosing areas of equal snowfall, but in special cases figures are also given. Chart VIII is published only when the general snow cover is sufficiently extensive to justify its preparation.

Chart IX.—Average values of pressure, temperature, and prevailing wind directions, and storm tracks over the North Atlantic Ocean for the corresponding month of last year.

MONTHLY WEATHER REVIEW.

NOVEMBER, 1916

TABLE I.—Climatological data for Weather Bureau stations, November, 1916.

Districts and stations.	Elevation of instruments.			Pressure.			Temperature of the air.						Precipitation.			Wind.			Cloudy days.			Average cloudiness.			Total snowfall.						
	Barometer above sea-level.	Thermometer above ground.	Anerometer above ground.	Station, reduced to mean of 24 hours.	Sealevel, reduced to mean of 24 hours.	Departure from normal.	Mean max. + mean min. + 2.	Departure from normal.	Mean maximum.	Date.	Mean minimum.	Date.	Mean minimum.	Greatest daily range.	Mean wet thermometer.	Mean temperature of the dew point.	Total.	Departure from normal.	Days with 0.01 inch or more.	Total movement.	Prevailing direction.	Maximum velocity.	Date.	Clear days.	Partly cloudy days.	Cloudy days.	Total snowfall.				
	Ft.	Ft.	Ft.	In.	In.	In.	°F.	°F.	°F.	Date.	°F.	°F.	Date.	°F.	°F.	In.	In.	Miles.	Miles per hour.	Direction.						In.	In.				
<i>New England.</i>																															
Eastport.	76	67	85	29.95	30.04	+0.03	34.2	-0.2	39.1	2.44	2.44	-1.0	73	2.12	8	7,589	nw.	54	x.	24	7	10	13	6.5	10.7	...					
Greenville.	1,070	6	28.84	30.04	-	29.2	9	37	69	0	17	22	31	32	27	4.17	13	10,533	sw.	61	ww.	11	13	7	10	5.1	6.1	...			
Portland, Me.	103	82	117	29.97	30.10	+ .05	36.6	-1.0	61	9	40	16	17	29	32	26	69	2.98	-1.0	13	3,631	n.	33	s.	24	6	8	18	6.6	4.6	...
Concord.	288	70	79	27.77	30.09	+ .03	36.0	-0.5	39	9	46	12	22	26	35	-	2.63	-0.8	14,9,275	w.	46	w.	11	8	7	15	6.6	10.6	...		
Burlington.	404	11	48	29.62	30.08	+ .03	34.3	+ 0.6	63	9	41	6	26	28	27	-	2.68	-0.5	15,5,201	s.	35	sw.	23	3	9	18	7.2	11.6	...		
Northfield.	876	12	80	29.11	30.09	+ .04	31.4	-0.4	67	9	42	22	21	35	36	28	80	3.13	+ 2.4	8,7,687	s.	35	w.	25	11	8	11	5.2	0.7	...	
Boston.	125	115	183	29.98	30.10	+ .05	42.6	+ 1.1	65	9	50	26	26	39	34	34	74	2.53	-0.7	9,12,510	sw.	44	w.	23	7	10	13	6.1	T.	...	
Nantucket.	12	14	90	30.10	30.11	+ .06	44.5	-0.3	60	9	50	25	21	40	42	39	74	2.39	-1.5	8,14,497	sw.	54	w.	24	14	6	10	4.9	T.	...	
Block Island.	26	11	48	30.08	30.11	+ .05	45.0	-0.3	60	9	50	25	21	40	42	39	74	2.52	-1.5	8,14,497	sw.	54	w.	23	13	8	12	5.6	T.	...	
Narragansett Pier.	9																														
Providence.	160	215	251	29.93	30.11	+ .04	41.2	+ 0.8	65	9	49	20	21	33	36	32	73	1.92	-2.0	10,9,232	w.	48	ww.	11	15	9	12	5.3	2.5	...	
Hartford.	159	122	140	29.93	30.11	+ .03	41.3	+ 1.8	65	9	50	20	22	33	36	31	70	2.83	-1.0	11,5,722	s.	38	s.	23	23	8	8	5.3	0.6	...	
New Haven.	106	117	153	30.01	30.13	+ .06	43.2	+ 1.9	65	9	52	23	26	35	36	39	76	2.54	-1.0	10,6,356	sw.	30	s.	23	14	8	8	4.3	T.	...	
<i>Middle Atlantic States.</i>																															
Albany.	97	102	115	30.00	30.11	+ 0.03	39.2	+ 0.8	64	9	48	18	22	32	35	34	30	74	2.88	+ 0.1	11,5,038	s.	26	s.	9	12	6	12	5.3	0.3	...
Binghamton.	871	10	89	29.16	30.11	+ .02	40.0	+ 2.4	70	8	48	18	22	32	35	32	65	1.57	-1.9	14,3,928	sw.	26	sw.	24	7	7	16	6.6	2.2	...	
New York.	314	414	454	29.78	30.13	+ .04	44.8	+ 0.8	69	9	52	25	26	38	35	39	65	1.47	-0.9	6,4,277	w.	33	w.	24	13	5	13	5.2	T.	...	
Harrisburg.	374	94	104	29.76	30.17	+ .06	43.1	+ 1.4	70	9	51	24	21	36	32	37	64	1.45	-1.6	8,7,363	s.	42	sw.	23	16	1	13	4.2	T.	...	
Philadelphia.	117	123	190	30.03	30.16	+ .06	48.8	+ 1.9	72	9	54	23	16	40	37	34	74	2.49	-1.2	12,5,113	sw.	31	ww.	24	12	5	13	5.2	T.	...	
Reading.	325	81	98	29.80	30.16	+ .03	43.6	-0.7	73	9	52	24	22	36	33	36	72	2.01	-0.3	5,4,546	ww.	42	sw.	23	5	12	13	6.7	0.4	...	
Scranton.	806	111	119	29.25	30.14	+ .05	40.8	+ 1.7	69	9	49	21	21	32	33	36	72	1.78	-0.7	10,9,150	s.	31	s.	23	17	4	9	4.1	T.	...	
Atlantic City.	52	37	48	30.11	30.17	+ .07	47.2	+ 1.7	67	9	54	25	26	40	35	42	74	2.00	-1.0	10,5,989	sw.	31	s.	23	17	0	7	3.9	0.3	...	
Cape May.	18	13	49	30.17	30.19	+ .05	47.8	+ 0.4	68	9	55	29	26	41	36	44	72	1.51	-1.3	9,7,093	s.	57	sw.	23	16	4	10	4.5	T.	...	
Sandy Hook.	22	10	57	30.11	30.13	+ .03	45.7	-	68	9	52	28	26	40	32	36	73	1.31	-2.1	8,8,130	w.	46	sw.	23	15	3	12	4.9	T.	...	
Trenton.	190	159	183	29.93	30.14	+ .03	43.7	-	70	9	52	24	26	36	39	34	73	1.31	-1.0	8,4,800	sw.	29	sw.	20	15	6	9	4.3	T.	...	
Baltimore.	123	100	113	30.04	30.17	+ .06	47.3	+ 1.5	75	9	55	25	16	40	37	41	74	1.45	-1.6	8,4,491	sw.	32	sw.	24	10	4	10	4.2	T.	...	
Washington.	112	62	85	30.04	30.18	+ .04	46.3	+ 1.3	75	9	56	22	16	37	34	39	68	1.52	-1.3	6,4,520	s.	36	sw.	23	16	6	8	4.7	T.	...	
Lynchburg.	681	153	188	29.42	30.18	+ .05	48.4	+ 2.3	79	9	50	22	16	37	34	39	70	1.31	-2.1	7,5,277	s.	35	w.	23	17	7	8	3.3	0.2	...	
Norfolk.	91	170	205	30.03	30.18	+ .07	52.4	+ 1.2	74	9	60	28	16	45	30	46	71	1.34	-1.4	6,9,150	s.	46	sw.	23	16	7	8	3.8	0.0	...	
Richmond.	144	11	52	30.02	30.18	+ .06	48.5	-0.3	70	9	60	22	20	37	34	41	70	1.30	-1.1	7,5,277	s.	46	sw.	23	17	4	9	4.2	T.	...	
Wytheville.	2,203	49	55	27.77	30.20	+ .07	44.2	+ 1.2	70	5	55	17	18	34	34	37	73	0.87	-2.2	9,5,128	w.	35	w.	23	17	7	8	3.3	0.2	...	
<i>South Atlantic States.</i>																															
Asheville.	2,255	70	84	27.81	30.22	+ 0.05	46.3	+ 1.2	70	9	57	18	16	35	36	39	71	1.36	-1.9	10,6,379	nw.	35	se.	23	20	3	7	3.3	0.0	...	
Charlotte.	773	153	161	29.34	30.19	+ .05	53.0	+ 2.6	73	9	63	23	16	43	29	45	86	0.36	-2.5	6,7,192	ne.	39	s.	23	17	6	7	3.3	0.0	...	
Hatteras.	11	50	59	30.16	30.17	+ .06	57.1	+ 0.7	75	14	63	34	16	52	20	53	49	77	1.21	-2.6	8,9,803	ne.	43	n.	15	17	9	4	3.2	0.0	...
Manteo.	12	4	48																												
Raleigh.	376	103	110	29.78	30.19	+ .06	52.2	+ 2.0	73	5	62	24	16	42	29	45	71	0.93	-1.4	6,5,288	sw.	32	sw.	23	17	6	7	3.5	0.0	...	
Wilmington.	78	81	91	30.10	30.19	+ .07	56.6	+ 2.5	80	10	66	29	16	47	31	36	80	1.97	-0.5	7,4,760	sw.	29	sw.	23	18	5	7	3.3	0.0	...	
Charleston.	48	91	92	30.12	30.17	+ .05	59.2	+ 1.1	79	10	67	32	16	51	26	33	84	1.11	-1.8	6,6,750	n.	34	sw.	23	16	8	6	3.3	0.0	...	
Columbia, S. C.	351	41	52	29.79	30.18	+ .05	55.2	+ 1.0	80	9	63	28	16	45	32	39	84	0.56	-1.7	5,4,322	s.	32	sw.	23	17	5	8	3.6	0.0	...	
Augusta.	180	62	77	29.98	30.18	+ .05	55.7	+ 1.8	80	9	63	26	16	43	42	49	78	1.46	-1.5	5,3,393	sw.	24	sw.	23	17	3	10	3.7	0.0	...	
Savannah.	65	150	194	30.10	30.17	+ .05	60.2	+ 2.7	81	10	69	34	16	51	35	43	76	1.19	-1.2	30,7,790	s.	30	sw.	23	15	7	8	4.1	0.0	...	
Jacksonville.	43	200	245	30.10	30.15	+ .05	63.1	+ 1.8	83	10	71	33	16	56	26	50	53	77	2.76	+ 0.6	10,9,109	ne.	36	sw.	23	17	4	9	4.1	0.0	...

TABLE I.—*Climatological data for Weather Bureau stations, November, 1916—Continued.*

Districts and stations.	Elevation of instruments.		Pressure.										Temperature of the air.										Precipitation.				Wind.				Average cloudiness.		
	Barometers above sea-level.	Thermometer above ground.	Anerometer above ground.		Station, reduced to mean of 24 hours.		Sea level, reduced to mean of 24 hours.		Departure from normal.		Mean maximum.		Minimum.		Date.		Mean minimum.		Greatest daily range.		Mean wet thermometer.		Mean temperature of the dew point.		Days with 0.01 inch or more.		Total movement.		Prevailing direction.		Maximum velocity.		
	Ft.	Ft.	Ft.	In.	In.	In.	In.	In.	In.	° F.	+ 2.3	° F.	° F.	° F.	° F.	° F.	° F.	° F.	%	In.	In.	Miles	Total.	Departure from normal.	Days or more.	Miles per hour.	Date.	Clear days.	Partly cloudy days.	Cloudy days.	Total snowfall.	Snow on ground at end of month.	
<i>Ohio Valley and Tennessee.</i>																																	
Chattanooga.....	762	189	213	29.39	30.23	+ 0.08	51.7	+ 1.4	79	5.62	21	15	41	36	43	37	64	2.93	- 0.6	10	5,527	s.	32	sw.	23	19	6	5	3.1	T.	...		
Knoxville.....	936	97	100	29.12	30.20	+ 0.07	48.8	+ 1.7	75	6.60	20	16	38	33	42	36	70	0.56	- 1.0	9	2,856	ne.	28	sw.	9	20	3	7	3.1	T.	...		
Memphis.....	399	78	97	29.77	30.20	+ 0.08	54.0	+ 2.6	78	6.63	21	15	45	25	45	35	64	0.86	- 3.7	6	6,521	s.	23	20	6	5	2.5	T.	0.0				
Nashville.....	546	168	191	29.61	30.21	+ 0.09	50.2	+ 1.5	78	5.62	19	15	39	35	42	35	64	1.00	- 2.8	6	6,254	se.	36	w.	23	21	6	5	2.5	T.	...		
Lexington.....	928	193	230	29.10	30.19	+ 0.07	47.4	+ 2.7	78	6.57	14	15	38	27	46	32	60	1.25	- 2.2	6	11,113	sw.	23	20	1	8	2.9	T.	...				
Louisville.....	625	218	255	29.59	30.18	+ 0.04	48.5	+ 2.2	78	6.68	18	15	40	27	42	36	67	1.17	- 3.0	6	9,298	s.	52	sw.	23	21	1	5	3.4	0.5	...		
Evansville.....	431	130	173	29.65	30.16	+ 0.04	49.5	+ 4.2	78	5.58	18	15	35	31	38	32	68	0.51	- 3.0	6	5,531	s.	35	sw.	23	18	7	5	3.4	0.5	...		
Indianapolis.....	822	191	230	29.21	30.15	+ 0.03	45.0	+ 3.4	78	6.65	14	15	35	31	38	32	67	1.73	- 1.8	6	9,816	s.	42	nw.	23	16	6	8	2.9	0.7	...		
Terre Haute.....	575	90	129	29.49	30.12	-	46.0	+ 2.3	78	6.56	14	15	36	31	39	33	68	1.71	- 1.6	6	8,132	sw.	33	14	11	5	4.1	0.8	...				
Cincinnati.....	628	11	51	29.46	30.16	+ 0.04	45.4	+ 5.8	75	5.46	14	15	35	31	38	32	68	1.86	- 1.4	6	6,467	sw.	36	sw.	23	18	4	8	3.5	0.2	...		
Columbus.....	824	173	222	29.25	30.15	+ 0.04	43.4	+ 2.0	72	7.53	15	15	34	31	38	33	72	1.58	- 1.5	6	9,111	sw.	48	w.	24	17	4	9	3.8	0.3	...		
Dayton.....	869	181	216	29.15	30.13	-	43.6	+ 1.5	73	6.51	13	15	34	32	38	33	76	1.67	- 1.2	6	8,862	sw.	42	w.	23	19	2	8	3.5	0.8	...		
Pittsburgh.....	842	353	410	29.22	30.15	+ 0.05	44.5	+ 1.6	71	8.53	18	16	36	27	39	32	69	1.86	- 0.7	6	9,157	sw.	48	w.	24	13	5	12	5.0	0.3	...		
Elkins.....	1,940	41	50	28.99	30.20	+ 0.03	41.6	+ 2.0	75	8.55	16	15	28	23	35	31	77	1.50	- 1.4	6	2,808	w.	26	w.	23	11	8	11	5.4	T.	...		
Parkersburg.....	638	77	84	29.51	30.18	+ 0.06	45.5	+ 2.3	74	5.46	22	15	35	30	39	34	72	1.84	- 1.0	5	4,393	s.	22	nw.	9	11	6	13	5.1	T.	...		
<i>Lower Lake Region.</i>							39.9	+ 0.8									74	1.84	- 1.2										6.2				
Buffalo.....	767	247	280	29.22	30.07	+ 0.02	39.2	- 0.1	68	8.45	18	26	33	25	36	32	78	1.53	- 1.8	14	15,710	w.	72	w.	24	7	16	6.7	8.5	...			
Canton.....	448	10	61	29.58	30.07	-	33.8	- 0.1	58	8.42	1	26	26	29	34	30	75	1.56	- 1.8	11	9,511	sw.	56	w.	24	7	10	6.4	3.0	...			
Oswego.....	335	76	91	29.70	30.08	+ 0.03	38.6	- 0.5	70	8.45	12	26	33	28	34	30	72	1.76	- 1.0	15	6,752	sw.	44	w.	24	5	9	16	7.7	1.1	...		
Rochester.....	523	97	113	29.50	30.09	+ 0.04	39.4	+ 1.5	74	8.46	20	26	33	28	34	30	74	2.00	- 0.7	17	9,059	s.	45	sw.	24	7	15	8.7	10.3	...			
Syracuse.....	537	97	113	29.44	30.06	+ 0.03	38.6	- 0.1	68	9.45	14	26	32	26	34	30	74	2.00	- 0.7	17	12,225	sw.	54	w.	24	11	4	15	5.5	10.1	...		
Erie.....	714	130	166	29.29	30.07	+ 0.01	41.3	+ 0.2	73	8.48	19	16	35	25	37	32	70	2.34	- 1.3	13	12,384	sw.	55	sw.	23	7	16	6.3	12.2	...			
Cleveland.....	762	190	201	29.28	30.10	+ 0.03	42.3	+ 1.9	71	8.49	19	16	35	26	37	33	78	2.35	- 0.4	12	12,225	sw.	54	w.	24	11	4	15	5.5	10.1	...		
Sanilacsky.....	629	62	103	29.40	30.10	+ 0.02	42.2	+ 1.4	72	5.40	17	15	35	25	37	33	73	2.19	- 0.6	9	11,114	sw.	46	w.	24	11	7	12	5.5	0.1	...		
Toledo.....	628	208	243	29.49	30.10	+ 0.03	41.7	+ 2.0	72	5.40	18	15	34	26	37	33	75	1.79	- 0.9	10	12,341	sw.	45	sw.	23	10	7	13	5.4	0.2	...		
Fort Wayne.....	856	113	124	29.17	30.11	-	41.4	+ 0.8	73	5.40	13	15	32	36	36	32	74	1.98	- 0.7	9	8,820	sw.	40	sw.	23	8	9	13	6.0	0.5	...		
Detroit.....	730	128	245	29.27	30.08	+ 0.02	40.5	+ 1.9	70	7.48	16	16	34	25	36	33	78	1.21	- 1.4	11	8,977	w.	44	sw.	23	8	9	13	6.0	0.5	...		
<i>Upper Lake Region.</i>							35.7	+ 1.7									78	1.81	- 0.6										6.9				
Alpena.....	609	13	92	29.35	30.03	+ 0.02	35.1	+ 1.4	64	8.41	12	26	29	30	32	30	85	2.15	- 0.4	13	8,149	nw.	46	nw.	24	4	9	17	7.3	7.3	T.		
Escanaba.....	612	54	80	29.35	30.03	+ 0.01	32.6	+ 0.9	56	6.39	9	15	26	28	29	25	78	0.49	- 1.8	6	6,300	nw.	34	nw.	24	9	16	6.3	1.5	...			
Grand Haven.....	632	54	92	29.35	30.05	+ 0.01	39.2	+ 1.2	70	6.45	12	26	33	30	36	32	74	2.37	- 0.2	13	10,421	s.	53	w.	24	10	3	17	6.3	1.4	...		
Grand Rapids.....	707	70	87	29.28	30.06	+ 0.01	39.8	+ 1.7	68	7.47	19	15	33	28	38	31	75	2.12	- 0.4	13	5,260	w.	30	w.	24	7	5	18	7.7	1.0	...		
Houghton.....	684	62	93	29.26	30.01	- 0.01	31.0	- 0.5	64	6.37	10	16	26	28	34	31	81	1.17	- 1.6	11	5,263	w.	38	w.	24	6	5	19	6.9	0.4	...		
Lansing.....	878	11	62	29.10	30.06	-	38.8	- 2.0	70	7.48	16	16	30	28	34	31	81	1.68	- 0.7	11	5,390	sw.	26	nw.	24	7	19	6.9	12.7	...			
Ludington.....	637	60	66	29.33	30.04	-	37.8	-	67	6.43	18	26	33	27	35	32	80	2.86	-	16	8,926	w.	41	nw.	24	7	19	6.9	12.7	...			
Marquette.....	734	77	111	29.22	30.05	+ 0.03	32.4	+ 0.5	62	6.38	10	25	27	25	32	29	78	4.84	- 0.3	14	7,565	w.	41	s.	24	3	8	19	7.7	1.5	...		
Port Huron.....	638	70	129	29.35	30.06	+ 0.01	38.8	+ 1.6	66	6.46	16	26	31	27	35	32	81	1.06	- 0.8	9	9,498	sw.	40	nw.	24	7	19	6.1	0.4	...			
Saginaw.....	641	48	82	29.34	30.05	-	38.4	-	68	6.46	14	26	31	29	33	32	83	1.58	- 0.7	10	8,031	w.	34	nw.	24	5	23	2.3	1.0	...			
Smith St. Marie.....	614	11	81	29.31	30.03	+ 0.02	31.9	+ 1.2	52	7.37	7	25	27	28	30	28	84	2.62	- 0.3	22	6,679	se.	39	nw.	24	1							

TABLE I.—Climatological data for Weather Bureau stations, November, 1916—Continued.

Districts and stations.	Elevation of instruments.		Pressure.				Temperature of the air.						Precipitation.			Wind.			Clear days.	Cloudy days.	Average cloudiness.	Total snowfall.								
	Barometer above sea-level.	Thermometer above ground.	Anerometer above ground.	Station, reduced to mean of 24 hours.	Sealevel reduced to mean of 24 hours.	Departure from normal.	Mean max. + mean min. + 2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.	Mean wet thermometer dew point.	Total.	Days with 0.01 inch or more.	Total movement.	Prevailing direction.	Miles per hour.	Date.	Date.	Date.						
	Ft.	Ft.	Ft.	In.	In.	In.	°F.	°F.	°F.		°F.	°F.		°F.	°F.	%	In.	In.	Miles.											
<i>Northern Slope.</i>																														
Billings.....	3,140	5	44	27.37	30.08	+0.05	32.8	-1.6	30.4	76	45	-19	13	21	52	28	0.62	-0.3	3,7308	sw.	36	2	17	8	5	4.6	4.6			
Havre.....	2,505	11	44	27.37	30.08	+0.05	31.5	-0.9	30.9	70	42	-21	12	20	36	23	61	0.32	-0.4	5,5387	sw.	36	2	11	10	9	5.2	3.5		
Helena.....	1,110	87	114	25.88	30.21	+1.1	29.0	-1.7	27.7	43	38	-12	12	20	36	23	76	0.80	-1.1	12,2805	w.	24	2	11	12	11	6.2	4.0		
Kalispell.....	2,962	11	34	27.06	30.23	+1.6	29.0	-4.0	28.0	60	47	-37	3	13	29	24	70	0.39	-0.2	7,4391	se.	30	2	17	19	3	3.1	1.7		
Miles City.....	2,371	26	48	27.54	30.16	+0.9	35.4	+4.5	35.2	5	47	-12	13	21	44	39	51	0.51	0.0	6,0801	w.	39	2	13	19	7	4.6	4.7		
Rapid City.....	1,259	50	58	26.60	30.17	+0.9	35.5	+1.9	35.0	58	48	-17	13	23	42	38	52	0.88	+0.5	7,1186	w.	68	2	14	13	8	3.6	12.1		
Cheyenne.....	6,088	84	101	24.03	30.17	+1.0	31.3	-3.7	28.9	57	42	-21	13	23	48	41	52	0.82	+0.2	2,2844	w.	44	2	14	13	4	4.4	0.6		
Lander.....	5,372	60	68	24.70	30.20	+1.0	24.4	-5.3	35.5	3	38	-23	13	23	49	41	51	0.23	0.0	8,3879	nw.	48	2	14	10	6	4.2	8.8		
Sheridan.....	3,790	10	47	26.16	30.19	-0.1	28.9	-5.9	50	3	34	-20	13	23	49	41	51	0.20	0.0	13,6392	s.	38	2	17	13	5	5.9	3.8		
Yellowstone.....	6,200	11	48	25.94	30.28	+1.7	23.4	-5.9	50	3	34	-20	13	23	49	41	51	0.17	0.0	5,157	w.	28	2	17	13	8	3.7	3.6		
North Platte.....	2,821	11	31	27.17	30.18	+10	35.8	+0.7	32.8	3	40	-5	14	22	41	43	52	0.47	+0.1	13,6392	s.	38	2	17	13	5	5.9	3.8		
<i>Middle Slope.</i>							42.8	+1.1									65	1.16	+0.2								3.0			
Denver.....	5,292	106	113	24.78	30.16	+0.10	38.1	-1.1	38.1	76	50	-3	13	26	38	29	58	0.66	+0.1	9,5755	se.	31	2	20	5	5	3.1	10.2		
Pueblo.....	1,685	80	86	25.35	30.14	+0.09	38.3	-1.0	38.3	79	54	-8	14	23	30	29	58	0.20	-0.2	4,4771	nw.	36	2	9	23	4	2.2	3.4		
Concordia.....	1,392	50	58	28.61	30.12	+0.4	42.8	+2.9	42.8	81	3	54	-6	14	31	36	35	29	0.77	-0.2	3,6555	nw.	33	2	15	10	5	3.9	4.4	
Dodge City.....	2,509	11	51	27.48	30.14	+0.07	42.0	+1.5	42.5	55	57	-2	13	27	34	34	50	0.03	-0.5	1,7398	n.	38	2	26	21	5	4.2	0.3		
Wichita.....	1,350	139	158	28.04	30.10	+0.02	46.2	+2.4	47.9	73	5	58	-12	14	36	29	39	34	0.98	+1.8	10,885	s.	51	2	26	20	6	3.2	T.	
Altus.....	1,410	5	5	5	5	5	50.4	-	50.4	84	1	64	-14	14	37	41	41	0.99	-	3	n.	-	-	23	0	0.7	0.0			
Muskogee.....	652	4	5	5	5	5	50.2	-	50.2	81	3	62	-15	14	39	41	41	3.34	-	5	s.	-	-	19	2	9	0.0			
Oklahoma.....	1,214	10	47	28.83	30.14	+0.06	49.7	+1.8	49.7	83	2	61	-14	14	38	41	41	70	2.35	+0.1	5,11,871	s.	44	2	22	5	3	2.6	0.1	
<i>Southern Slope.</i>							49.7	-1.3									0.48	-0.7									2.6			
Abilene.....	1,738	10	52	28.30	30.14	+0.07	52.1	-0.5	52.1	84	1	65	-16	14	39	42	43	61	0.88	-0.4	8,8057	s.	38	2	22	4	5	2.5	0.2	
Amarillo.....	3,676	19	49	26.34	30.13	+0.08	44.4	+0.6	44.4	85	4	58	-16	14	30	42	35	63	0.40	-0.8	8,233	sw.	35	2	11	23	3	3.0	0.7	
Del Rio.....	944	64	71	29.13	30.13	+0.08	57.7	-1.6	57.7	83	1	70	-25	16	46	39	39	0.21	-1.0	2,7,222	e.	40	2	21	9	4	3.0	0.0		
Roswell.....	3,506	75	85	26.46	30.14	+0.11	44.5	-3.6	44.5	87	5	61	-6	14	28	52	34	54	0.44	-0.7	2,4,833	u.	31	2	24	3	3	1.7	3.4	
<i>Southern Plateau.</i>							47.2	-1.8									43	0.12	-0.5								1.6			
El Paso.....	3,762	110	133	26.27	30.07	+0.07	51.3	+0.3	51.3	84	4	66	-18	15	37	38	38	34	0.52	-0.1	1,7,108	nw.	43	2	21	2	1	1.2	T.	
Santa Fe.....	7,013	57	66	23.28	30.10	+0.07	38.9	+0.7	38.9	2	51	-6	14	27	31	28	17	47	0.06	-0.7	1,5,556	e.	37	2	20	10	6	2.0	1.4	
Flagstaff.....	6,908	8	57	23.40	30.10	+0.08	34.4	-0.2	34.4	73	1	51	-8	13	18	47	25	50	0.00	-	0	w.	44	2	24	6	0	0.6	0.6	
Phoenix.....	1,108	76	81	28.88	30.05	+0.17	55.8	-2.9	55.8	82	2	74	-28	14	37	44	42	32	0.00	-1.0	0,3,364	e.	20	2	15	28	2	1.0	0.6	
Yuma.....	141	9	54	29.89	30.04	+0.06	60.0	-1.9	60.0	91	1	75	-36	22	45	40	45	28	0.00	-0.3	0,4,423	u.	33	2	13	28	2	0.6	0.0	
Independence.....	3,910	11	42	26.06	30.12	+0.07	42.7	-6.5	42.7	1	60	-16	13	26	43	43	43	0.00	-0.3	0,4,166	s.	32	2	22	5	3	3.3	0.0		
<i>Middle Plateau.</i>							35.2	-4.3									54	0.32	-0.6								2.9			
Reno.....	1,532	74	81	25.60	30.24	+0.13	37.6	-3.4	37.6	76	2	52	-8	14	23	43	29	19	52	0.05	-1.0	2,4,257	w.	38	2	26	6	2	2.5	T.
Tonopah.....	6,030	12	20	24.16	30.20	-	37.2	-	37.2	66	2	46	-6	13	24	39	24	19	48	0.08	-0.8	2,6,475	nw.	43	2	21	7	8	3.2	0.1
Winnemucca.....	4,344	18	56	25.77	30.25	+0.14	33.0	-4.5	33.0	74	2	49	-9	13	17	47	25	17	59	0.44	-0.3	5,4,620	ne.	33	2	21	6	3	2.4	0.3
Modena.....	5,479	10	43	24.72	30.20	+0.12	33.6	-5.4	33.6	74	2	50	-5	14	17	45	24	12	48	0.07	-0.5	1,7,096	w.	51	2	21	6	3	2.4	0.3
Salt Lake City.....	4,380	147	189	25.77	30.24	+0.12	36.6	-4.2	36.6	70	2	45	-5	13	28	37	30	20	57	0.00	-0.5	6,4,447	sw.	50	2	19	6	1	4.4	5.0
Grand Junction.....	4,602	82	96	25.50	30.16	+0.08	35.8	-4.1	35.8	6	48	-6	13	23	37	28	20	57	0.34	-0.2	2,4,256	sc.	56	2	19	8	3	2.6	4.8	
<i>Northern Plateau.</i>							34.3	-4.4									66	1.29	-0.1								5.8			
Baker.....	3,471	48	53	26.66	30.27	+0.11	31.2	-3.7	31.2	64	2	42	-4	13	21	33	27	20	64	0.35	-0.8	4,4,851	se.	30	2	27	12	9	5.1	2.0
Boise.....	3,739	78	86	27.36	30.30	+0.13	36.5	-3.1	36.5	70	3	46	-7	13	27	39	30	21	55	1.07	+0.2	7,3,034	se.	24	2	27	9	7	6.5	0.4
Lewiston.....	757	40	48	29.43	30.26	+0.12	37.0	-2.9	37.0	62	3	46	-9	13	28	32	32	17	50	0.37	-0.6	2,2,194	e.	22	2	27	9	7	6.5	0.4
Pocatello.....	4,477	60	68	26.51	30.26	+0.12	31.5	-4.8	31.5	68	2	42	-1	13	21	34	26	20	65	0.61	+0.1	6,7,024	sw.	40	2	27	9	13	6.5	5.0

TABLE II.—Accumulated amounts of precipitation for each 5 minutes, for the principal storms in which the rate of fall equaled or exceeded 0.25 inch in any 5 minutes, or 0.80 in 1 hour, during November, 1916, at all stations furnished with self-registering gages.

* Self-Register not in use.

† Record partly estimated.

~~No precipitation occurred during month.~~

TABLE II.—Accumulated amounts of precipitation for each 5 minutes, for the principal storms in which the rate of fall equaled or exceeded 0.25 inch in any 5 minutes, or 0.80 in 1 hour, during November, 1916, at all stations furnished with self-registering gages—Continued.

Stations.	Date.	Total duration.		Total amount of precipitation.	Excessive rate.		Amount before excessive rate began.	Depths of precipitation (in inches) during periods of time indicated.													
		From—	To—		Began—	Ended—		5 min.	10 min.	15 min.	20 min.	25 min.	30 min.	35 min.	40 min.	45 min.	50 min.	60 min.	80 min.	100 min.	120 min.
Milwaukee, Wis.	8-9			0.98															*		
Minneapolis, Minn.	7-8			0.42														*			
Mobile, Ala.	22-23	6:10 p.m.	D. N. a. m.	1.15	10:46 p.m.	11:13 p.m.	0.48	0.06	0.09	0.14	0.32	0.50	0.54								
Modena, Utah	5			0.07															*		
Montgomery, Ala.	23			2.30															0.59		
Moorhead, Minn.	20			0.08															*		
Mount Tamalpais, Cal.	4			0.47															0.15		
Nantucket, Mass.	23-24			0.68															0.37		
Nashville, Tenn.	9			0.30															0.17		
New Haven, Conn.	30			0.95															0.39		
New Orleans, La.	23			0.44															0.20		
New York, N. Y.	30			0.40															0.18		
Norfolk, Va.	14			0.51															0.15		
Northfield, Vt.	23-24			0.94															*		
North Head, Wash.	3			1.42															0.43		
North Platte, Nebr.	10-11			0.20															*		
Oklahoma, Okla.	21			1.48															0.27		
Omaha, Nebr.	7-8			0.22															*		
Oswego, N. Y.	4-5			0.38															*		
Palestine, Tex.	21-22	8:40 a.m.	12:25 p.m.	2.19	11:06 p.m.	11:24 p.m.	0.70	0.22	0.41	0.60	0.65										
Parkersburg, W. Va.	23			0.76															0.22		
Pensacola, Fla.	22-23	10:20 p.m.	4:35 a.m.	1.32	12:53 a.m.	1:27 a.m.	0.11	0.32	0.59	0.66	0.78	0.82	0.92	0.97							
Peoria, Ill.	23	12:50 a.m.	10:20 a.m.	1.29	7:52 a.m.	8:08 a.m.	0.67	0.11	0.34	0.50	0.51								0.19		
Philadelphia, Pa.	30			1.05															0.15		
Phoenix, Ariz.	†			0.48															0.01		
Pierre, S. Dak.	9			0.03															0.17		
Pittsburgh, Pa.	4			0.42															*		
Pocatello, Idaho	5			0.18															0.10		
Point Reyes Light, Cal.	4			0.31															0.15		
Port Angeles, Wash.	2			0.53															0.10		
Port Huron, Mich.	23			0.43															0.10		
Portland, Me.	23			0.70															0.14		
Portland, Oreg.	27			0.99															0.31		
Providence, R. I.	23			0.67															*		
Pueblo, Colo.	12			0.09															*		
Raleigh, N. C.	14			0.50															0.37		
Rapid City, S. Dak.	9-10			0.30															*		
Reading, Pa.	30			0.55															0.32		
Red Bluff, Cal.	25			0.99															0.26		
Reno, Nev.	25			0.04															*		
Richmond, Va.	30			0.36															0.27		
Rochester, N. Y.	4			0.24															0.13		
Roseburg, Oreg.	25			1.65															0.25		
Roswell, N. Mex.	21			0.42															*		
Sacramento, Cal.	25			0.36															0.11		
Saginaw, Mich.	8-9			0.60															*		
St. Joseph, Mo.	8			2.06															0.61		
St. Louis, Mo.	8			0.63															0.33		
St. Paul, Minn.	7-8			0.82															*		
Salt Lake City, Utah	5			0.33															*		
San Antonio, Tex.	21			0.80															0.47		
San Diego, Cal.	7			0.05															0.04		
Sand Key, Fla.	15			0.82															0.69		
Sandusky, Ohio	9			0.53															0.20		
Sandy Hook, N. J.	30			0.62															*		
San Francisco, Cal.	25			0.57															0.20		
San Jose, Calif.	5			0.22															0.17		
San Luis Obispo, Cal.	4			0.24															0.14		
Santa Fe, N. Mex.	8			0.06															*		
Sault Ste. Marie, Mich.	23-24			0.44															*		
Savannah, Ga.	30			0.24															0.21		
Scranton, Pa.	1			0.48															0.42		
Seattle, Wash.	3			1.06															0.28		
Sheridan, Wyo.	9-10			0.55															*		
Shreveport, La.	21-22	5:15 p.m.	1:30 p.m.	2.13	4:10 a.m.	4:42 a.m.	0.58	0.15	0.21	0.26	0.35	0.45	0.54	0.58					*		
Sioux City, Iowa	11-12			0.39															*		
Spokane, Wash.	25			0.56															*		
Springfield, Ill.	8			0.70															0.28		
Springfield, Mo.	8			0.94															0.35		
Syracuse, N. Y.	4-5			0.46															*		
Tacoma, Wash.	27			1.26															0.24		
Tampa, Fla.	15			2.79															0.67		
Tatoosh Island, Wash.	4			0.87															0.24		
Taylor, Tex.	21			0.75															0.28		
Terre Haute, Ind.	9			0.68															0.16		
Thomasville, Ga.	23	D. N. a.m.	9:50 a.m.	1.31	6:39 a.m.	7:09 a.m.	0.15	0.16	0.30	0.47	0.51	0.57	0.63						0.21		
Toledo, Ohio	3			0.36															*		
Tonopah, Nev.	5			0.06															0.59		
Topeka, Kans.	8			2.11															*		
Valentine, Nebr.	10-11			0.17															0.31		
Vicksburg, Miss.	22			0.78															0.25		
Walla Walla, Wash.	4			0.74															0.71		
Washington, D. C.	30			0.96															0.61		
Wichita, Kans.	7-8			2.73															*		
Williston, N. Dak.	20			0.18															*		
Wilmington, N. C.	29			0.82															0.34		
Winnemucca, Nev.	25			0.25															0.17		
Wytheville, Va.	12			0.23															0.12		
Yankton, S. Dak.	11			0.19															*		
Yellowstone Park, Wyo.	27-28			0.20															*		

* Self-register not in use.

[†] Record partly estimated.

† No precipitation occurred during month.

TABLE III.—Data furnished by the Canadian Meteorological Service, November, 1916.

Stations.	Altitude above M. S. L.* Jan. 1, 1916.	Pressure.			Temperature.					Precipitation.			
		Station reduced to mean of 24 hours.	Sea-level reduced to mean of 24 hours.	Depart- ture from normal.	Mean max. + mean min. + 2.	Depart- ture from normal.	Mean maxi- mum.	Mean mini- mum.	Highest.	Lowest.	Total.	Depart- ture from normal.	Total snowfall.
St. Johns, N. F.	125	29.65	29.79	-0.15	33.9	-2.6	39.2	28.7	54	16	3.27	-2.30	11.0
Sydney, C. B. I.	48	29.94	29.98	+ .03	36.0	-1.1	41.9	30.2	56	16	3.39	-2.05	13.5
Halifax, N. S.	88	29.92	30.03	+ .02	36.4	-0.9	43.3	28.6	60	11	2.07	-3.59	1.5
Yarmouth, N. S.	65	29.97	30.04	+ .02	33.3	-1.6	43.9	32.6	56	16	2.17	-2.39	2.5
Charlottetown, P. E. I.	38	29.94	29.98	+ .02	33.4	-2.1	38.2	28.6	53	13	3.64	-0.33	11.7
Chatham, N. B.	28	29.98	30.00	+ .03	30.1	-0.9	37.2	23.0	64	3	2.82	-0.93	10.2
Father Point, Que.	20	29.98	29.98	+ .02	28.1	-0.8	33.1	23.2	55	7	3.68	+0.57	8.6
Quebec, Que.	296	29.70	30.04	+ .02	28.4	-0.6	34.5	22.2	63	-4	4.02	+0.26	8.8
Montreal, Que.	187	29.83	30.05	+ .02	32.1	+ 0.3	38.4	25.8	64	2	2.75	-0.99	3.4
Stonecliffe, Ont.	489	29.40	30.03	+ .02	29.4	+ 0.3	37.3	21.5	68	-10	1.57	-1.01	1.4
Ottawa, Ont.	236	29.73	30.12	+ .10	31.7	0.0	38.7	24.7	63	-1	2.30	-0.14	4.4
Kingston, Ont.	285	29.73	30.07	+ .03	36.6	+ 1.6	42.8	30.7	58	9	1.91	-1.33	3.1
Toronto, Ont.	379	29.65	30.04	- .00	37.6	+ 2.0	44.5	30.7	61	12	1.64	-1.50	6.4
White River, Ont.	1,244	28.61	29.97	- .01	21.0	+ 0.5	29.9	12.1	52	-27	1.17	-0.68	9.7
Port Stanley, Ont.	592	29.44	30.10	+ .05	38.4	+ 1.6	45.4	31.4	59	13	2.23	-1.14	1.7
Southampton, Ont.	656	29.31	30.02	- .01	36.5	+ 1.5	42.7	30.2	65	11	4.01	+0.31	22.3
Parry Sound, Ont.	688	29.31	30.02	+ .01	33.4	+ 1.3	40.4	26.5	63	-3	4.53	+0.16	8.0
Port Arthur, Ont.	644	29.29	30.02	+ .02	28.0	+ 4.0	36.0	20.0	55	-2	0.13	-1.20	1.0
Winnipeg, Man.	760	29.14	30.00	- .04	27.0	+ 9.0	34.7	19.2	57	0	0.32	-0.76	1.1
Minnedosa, Man.	1,690	28.11	29.98	- .06	24.8	+ 7.6	32.9	16.8	58	-2	0.10	-0.90	1.0
Qu'Appelle, Sask.	2,115	27.63	29.93	- .07	26.0	+ 7.2	34.2	17.8	57	-6	0.15	-0.74	1.5
Medicine Hat, Alberta.	2,144	27.65	29.97	- .03	33.3	+ 5.9	43.2	23.4	68	-12	0.55	-0.37	5.5
Swift Current, Sask.	2,392	27.34	29.98	- .04	27.6	+ 4.4	38.1	17.2	61	-13	0.62	-0.07	6.2
Calgary, Alberta.	3,428	26.38	30.00	+ .02	31.1	+ 5.3	41.8	20.4	58	-10	0.28	-0.80	2.8
Banff, Alberta.	4,521	25.37	30.11	+ .15	22.6	-3.2	29.8	15.5	40	-21	1.24	-1.03	9.2
Edmonton, Alberta.	2,150	27.58	29.92	- .05	28.7	+ 5.8	37.7	19.8	52	-8	0.71	+0.13	7.0
Prince Albert, Sask.	1,450	28.33	29.93	- .10	25.3	+ 9.9	34.7	16.0	58	-4	0.65	-0.18	6.5
Battleford, Sask.	1,592	28.17	29.96	- .06	27.2	+10.9	36.5	18.0	61	0	T.	-0.58	
Kamloops, B. C.	1,262	28.89	30.22	+ .26	30.8	-2.6	37.4	24.3	57	5	0.64	-0.82	1.8
Victoria, B. C.	230	29.89	30.15	+ .16	42.3	-0.9	46.4	38.1	52	29	2.26	-4.71	0.0
Barkerville, B. C.	4,180	25.66	30.08	+ .18	22.1	-1.5	29.3	14.9	39	-13	4.97	+1.68	49.7
Hamilton, Bermuda.	151	29.97	30.13	+ .08	67.9	-0.8	72.9	63.0	79	52	7.00	+2.62	0.0

* The altitudes given above were furnished by the Director of the Canadian Meteorological Service Mar. 9, 1916, and refer to cisterns of barometers at the respective stations. Where sea-level pressures and departures are italicized new reduction factors are in course of computation.—C. A., Jr.



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